

Water Management

Waterless Urinals Pilot Project



Summary: At a Sustainable Universities Initiative conference on Green Buildings held in Charleston, South Carolina in October 2000, George Bandy (formerly of the University of Texas in Houston team) spoke about the successful introduction of waterless urinals at UT-Houston Health Science Center. This inspired Medical University of South Carolina attendees Christine von Kolnitz, Recycling Coordinator, and Michael Schmidt, Sustainable Universities Initiative Principal Investigator, to immediately begin a pilot project to test waterless urinals on their campus. A waterless urinal looks similar to a conventional urinal except that there is no flushing mechanism; it uses no water but an "absorbent trap". According to one manufacturer "a waterless urinal saves on average 45,000 gallons of water per year." With the amount of urinals on a college campus, especially ones that hold large athletic events, that can save a lot of water.

Project Goals

MUSC's first goal was to test the efficacy and acceptability of waterless urinals. So, in the spring of 2001, three waterless wall mounted urinals were installed in the Basic Sciences Building, in an area used primarily for research. One floor-mounted unit was installed in the Physical Plant. If the urinals perform as expected, the next steps for the University will be to consider the waterless urinals for new construction on campus, and as replacements for older urinals.

Description

Water supply and wastewater disposal issues are increasingly important in Charleston, as they are in other drought-threatened areas. MUSC's administration has welcomed innovative ideas for reducing water consumption and cost savings.

Pre-Project Considerations

1. Note that only a few companies currently manufacture waterless toilets, so choices are good but are few.
2. Check with local/state building code to ensure compliance.
3. Decide between floor or wall mounted units and investigate the advantages of each.

Campus Profile

Medical University of South Carolina

Charleston, SC

UG Students: 450

Grad Students: 1,950

Resident Students: 0

Faculty/Staff: 9,400

Campus Area: 61 acres

University/Hospital

Operating Budget:

\$364/481 Million

Green Activities

The University is involved in a five year (1999-2003)

Sustainable University

Initiative along with USC

and Clemson University to

find and implement ways to

incorporate sustainability

ideas into teaching, research

and University Operations.

One project undertaken by

MUSC's Recycling

Coordinator, Christine von

Kolnitz, and Microbiologist

Michael Schmidt, PhD is

investigating the use of

worms to recycle waste into

compost. Look at Erasing

our Eco Footprint at:

http://www.musc.edu/pr/annual_report_98_99.pdf. In

1997 and 1999, MUSC won

the "Best College/University

Recycling Program Award"

from the SC DHECS Office

of Solid Waste Reduction &

Recycling.

Disclaimer

The case studies identified in the BMP Catalog and the links to College and University web sites are provided for the convenience of the viewer. The provision of these case studies and links do not constitute any form of endorsement or approval by the US EPA. The US EPA does not exercise any editorial control over the information contained in these links, nor is the US EPA associated with or responsible for the content of these sites.

Created by Campus Consortium for Environmental Excellence through EPA Funding

Steps Taken

After choosing the product, detailed information was passed onto both maintenance and custodial staff to ensure that the urinals could be easily maintained and cleaned.

Four units were purchased along with supplies for one year. To estimate supplies, MUSC had to determine how many people used the restrooms each day and how often. They ‘guessed’ based upon the traffic flow and the individuals situated in the buildings.

Maintenance staff installed the urinals and the housekeepers were trained by video and on-site demonstration. All supplies were distributed to their correct locations. The manufacturer supplied stickers to place on the urinals that explain about the new urinal, why it is different, and “how to use it”.



Tools Used

For installation, the company states the following is required: a screwdriver, 5/16" (7.9mm), masonry drill bit and drill, putty knife, water supply cap, wrench, and caulk.

And....the waterless urinals.

Supplies include an eco-trap, and blue liquid seal that can be purchased by the quart or gallon.

Participants

Purchasing had policies on how to bid out the urinals. Facilities staff reviewed the products chosen, installed the urinals, and reviewed information on how to maintain them. Custodial staff cleans the urinals on the same type of schedule as conventional units.

Performance and Benefits

The urinal works by inserting a trap into the drain hole and filling the trap with a liquid seal. This seal has a different density than urine so it allows urine to pass through, out of the trap, and down the drain. When urine passes through the trap a small amount of liquid seal also goes down the drain. One is required to add seal and change the trap according to the average number of uses. The manufacturer’s recommendation is: 50 or less users - add the seal once a month and change the trap once a year; 50-100 users - add it twice a month and change the trap twice a year; 100-150 users add it three times a month and change the trap three times a year; and 150+ users would add it four times a month and change the trap four times a year.

The units have fewer mechanical parts, so maintenance costs were considerably less. Other benefits included fewer reports of unpleasant odors in the restroom by users and eliminating the need to touch a flushing handle to reduce exposure to bacteria. Finally, users are reminded periodically of water conservation, which should make them more conscientious of saving water in other aspects of their lives.

Financial Info

Initial Costs

Four urinals
(including supplies
for one year was
\$2032.30.

Funding

Sources

The Sustainable
Universities
Initiative.

Savings

Approximately \$150
a year for 2/3 urinals
including water,
sewer and
maintenance for a
medium use
restroom. Note, this
info reflects a
replacement.

Disclaimer

The case studies identified in the BMP Catalog and the links to College and University web sites are provided for the convenience of the viewer. The provision of these case studies and links do not constitute any form of endorsement or approval by the US EPA. The US EPA does not exercise any editorial control over the information contained in these links, nor is the US EPA associated with or responsible for the content of these sites.

Created by Campus Consortium for Environmental Excellence through EPA Funding

Lessons Learned

Post signs in the bathrooms explaining why the urinals have been installed.

Set up a preventive maintenance routine for changing out the 'Eco Traps'. MUSC's computer system sends out a paper ticket to the appropriate shop when the trap needs to be changed.

Installation was easy and there is very little maintenance. From a labor standpoint, MUSC states that anyone who uses this product will save money.

The University decided to consider using the waterless urinals for new construction or renovation projects as there is an obvious savings on water, sewer, and maintenance costs for new installations.

The University had an issue when the old urinal was cut off from its water supply and was capped. The cap on one of the pipes leaked and stained the new urinal with rust. So it is important to cap the lines correctly and in a way that is aesthetically pleasing.

Comments from users included reports of better smelling restrooms.

Two floods occurred in one of the buildings with the new urinals (the urinals did not cause the floods) and each time maintenance used the urinals to help get rid of water. The manufacturer tells you up front **not** to do this. It is very important to communicate to the maintenance staff so they know how the urinals can or cannot be used. It did not cause a major issue, but it is best if they are used as directed.

For Further Information

Christine von Kolnitz
Recycling Coordinator
Medical University of South Carolina
vonkolnc@musc.edu

Other Water Saving Programs



Campus Profile

**University of Texas
Health Science
Center at Houston,
Houston, Texas**
Students: 3,335
Faculty/Staff: 4998
Campus Area: 30
buildings covering
2.49 million sq. ft.
Operating Budget:
\$553.7 million for
FY 2003

"In June of 1999, the UTHSCH installed 10 waterless urinals. Since that time, 37 additional waterless urinals have been installed throughout the campus. Our experience with them has been very positive. They now are our standard for urinals, and are incorporated in to the design for all of our new facilities projects.

In addition to saving water and reducing sewer effluent, they are a great improvement over traditional urinals in both maintenance and hygiene. The moisture associated with standard water flush urinals plays host to microbes, bacteria and viruses. These pathogens become airborne when the urinals are flushed. By installing a waterless urinal, with predominantly dry surfaces and no flushing actions, the exposure to airborne bacteria is reduced tremendously. Due to the absence of water, ammonia oxide generated in the chemical reaction between urine and water is prevented or greatly reduced. This chemical reaction is what causes the odors typically associated with urinals. Yes, waterless urinals make bathrooms smell better! Also with hands free operation, waterless urinals eliminate the biggest source of germs – the flush valve handle.

Disclaimer

The case studies identified in the BMP Catalog and the links to College and University web sites are provided for the convenience of the viewer. The provision of these case studies and links do not constitute any form of endorsement or approval by the US EPA. The US EPA does not exercise any editorial control over the information contained in these links, nor is the US EPA associated with or responsible for the content of these sites.

Created by Campus Consortium for Environmental Excellence through EPA Funding

Green Activities

UTHSCH began teaching The Natural Step to the community in November 1997, and published its first Sustainability Report in 1998. UTHSCH has an integrated pest management system, worm bins, an alternate transportation program, environmental performance reporting, and a paper/plastic/glass recycling program. The University has an Urban Ecology Research Park, and expects a LEED Certified building (possibly platinum) to be completed by April 2004.

By installing a waterless urinal, routine maintenance is reduced according to housekeeping professionals and mechanical maintenance is reduced to changing the cartridges quarterly. The maintenance costs avoided that are associated with valve repair, clogged sewer pipes, vandalism or any other repairs are non-existent. With proper attention, the maintenance requirements for a waterless urinal are absolutely minimal compared with keeping mechanical flush systems operational and leak-free. These no-flush units are cost effective. Financial and resource savings over the fixture life cycle make the decision to convert a no brainer.

In fact the UTHSCH has a policy that if an auto flush valve breaks, the entire urinal assembly is replaced with a waterless urinal. And if any facility is remodeled, the conventional urinals are replaced with waterless urinals.

In order to gain acceptance of the waterless urinals, the University communicates and educates their users by placing plaquerts in close proximity to the waterless urinals that diagram its functions and/or display articles on the benefits of using a waterless urinal.”

Waterless Urinal Story (Used with Permission)

©Brian Yeoman, Linda Paisley & Marisa Hegyesi

See the following sites for the full report and for the full array of sustainability programs at UT Health Science Center:

http://www.uth.tmc.edu/ut_general/admin_fin/ss/FPD/publications/publications.htm.

<http://www.uth.tmc.edu/sustainability/>

http://www.uth.tmc.edu/ut_general/admin_fin/ss/FPD/index.html

Commentary

A master licensed plumber from Massachusetts, with over 15 years experience in many different types of facilities, states waterless urinals are good, they save water and are less of a problem to maintain than conventional units. Urinals typically use 1 gallon per flush, so in a small office building, on one urinal alone, you can save about 25 gallons a day. The plumber recommends reviewing state building code requirements because in Massachusetts, unlike many other states, commercial and residential buildings require threaded brass to cast iron for the drains, no PVC. And since minimal water is used, the concentrated urine can cause parts of the drain to rot.

Disclaimer

The case studies identified in the BMP Catalog and the links to College and University web sites are provided for the convenience of the viewer. The provision of these case studies and links do not constitute any form of endorsement or approval by the US EPA. The US EPA does not exercise any editorial control over the information contained in these links, nor is the US EPA associated with or responsible for the content of these sites.

Created by Campus Consortium for Environmental Excellence through EPA Funding